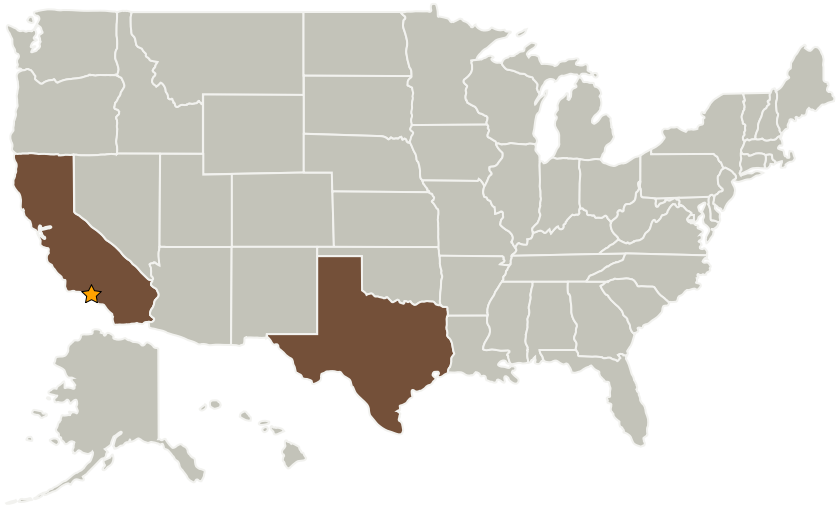
Reagent-Free Compact Online TOC Sensor, Phase II

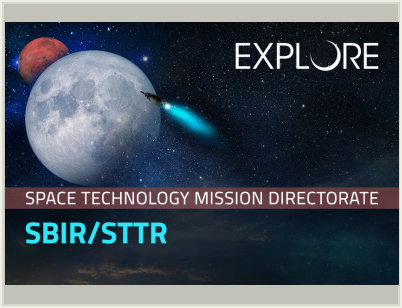
Completed Technology Project (2009 - 2011)

Project Introduction

A priority in Environmental Control and Life Support systems for extended space missions is to recover and process wastewater to provide potable water for crew consumption and oxygen generation. Total organic carbon (TOC) indicates the overall quality of reclaimed and stored water and their suitability for crew consumption by indicating the potential presence of hazardous chemicals. For extended missions, water monitoring requires reliable, real-time, online sensors, with limited or no need for resupplied chemicals, and low equivalent system mass (ESM). The goal of this project is to develop a reliable, compact, flight-qualifiable, microgravity-compatible, TOC analyzer (TOCA) for online, real-time water monitoring with an operational lifetime of 5 years with no need to resupply chemicals or water. Key components include an electrochemical unit that eliminates the need to resupply or store chemicals, an effective oxidation processor for TOC conversion to carbon dioxide, a compact, stable inorganic carbon sensing unit, and mesofluidic design for reduced ESM. During Phase I, Lynntech successfully demonstrated the feasibility of the proposed system by designing, fabricating, and testing both the critical components and an integrated breadboard TOCA. During Phase II, an optimized, reliable, compact, flight-qualifiable, microgravity-compatible TOCA prototype will be designed, fabricated, tested, and delivered to NASA.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California
Lynntech, Inc.	Supporting Organization	Industry	College Station, Texas

Primary U.S. Work Locations	
California	Texas

Project Transitions

December 2009: Project Start

December 2011: Closed out

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.1 Environmental Control & Life Support Systems (ECLSS) and Habitation Systems
    - TX06.1.2 Water Recovery and Management